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Introduction to App Deployment

How to deploy your Battlesnake and beyond

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I'm Matthew

Interested in Software Dev, System Design, and Infrastructure.

Probably knows how to deploy stuff...?

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What is this presentation?

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Lets deploy our Battlesnake

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https://docs.battlesnake.com/quickstart

replit

"online integrated development environment"

https://replit.com/

README.md | server.py

server.py

```python
import logging
import os
import typing

from flask import Flask
from flask import request


def run_server(handlers: typing.Dict):
    app = Flask("Battlesnake")

    @app.get("/")
    def on_info():
        return handlers["info"]()

    @app.post("/start")
    def on_start():
        game_state = request.get_json()
        handlers["start"](game_state)
        return "ok"

    @app.post("/move")
    def on_move():
        game_state = request.get_json()
        return handlers["move"](game_state)

    @app.post("/end")
    def on_end():
        game_state = request.get_json()
        handlers["end"](game_state)
        return "ok"

    @app.after_request
    def identify_server(response):
        response.headers.set(
            "server", "battlesnake/github/starter-snake-python"
        )
        return response

    host = "0.0.0.0"
```

Line 1 : Col 1 History

Webview

https://snake.mathyoumb.repl.co

{"apiversion":"1","author":"","color":"#888888","head":"default","tail":"default"}

Console | Shell

```
~/snake$ python3 main.py

Running Battlesnake at http://0.0.0.0:8000
 * Serving Flask app 'Battlesnake'
 * Debug mode: off
INFO
INFO
INFO
INFO
INFO
INFO
GAME START
MOVE 0: up
MOVE 1: right
MOVE 2: up
GAME OVER

INFO
```

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Ok so ... what is actually happening?

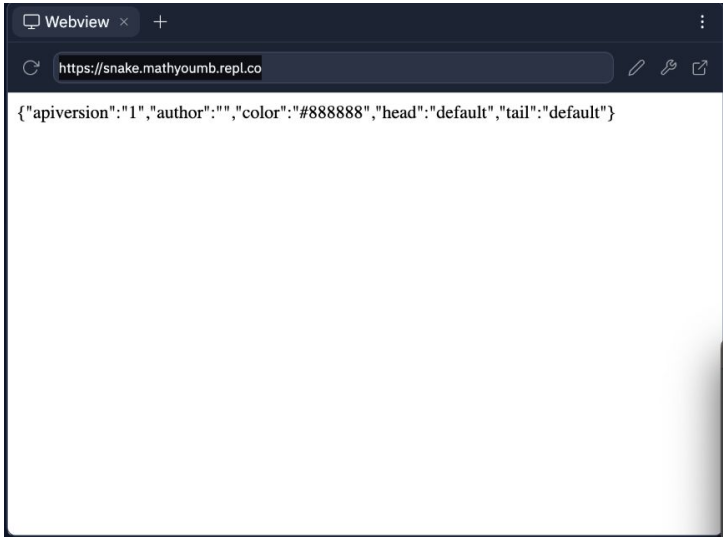
+

https://cloud.google.com/customers/repl-it

```
Console × Shell × +

~/snake$ python3 main.py

Running Battlesnake at http://0.0.0.0:8000
 * Serving Flask app 'Battlesnake'
 * Debug mode: off
```

Flask
web development,
one drop at a time

gunicorn

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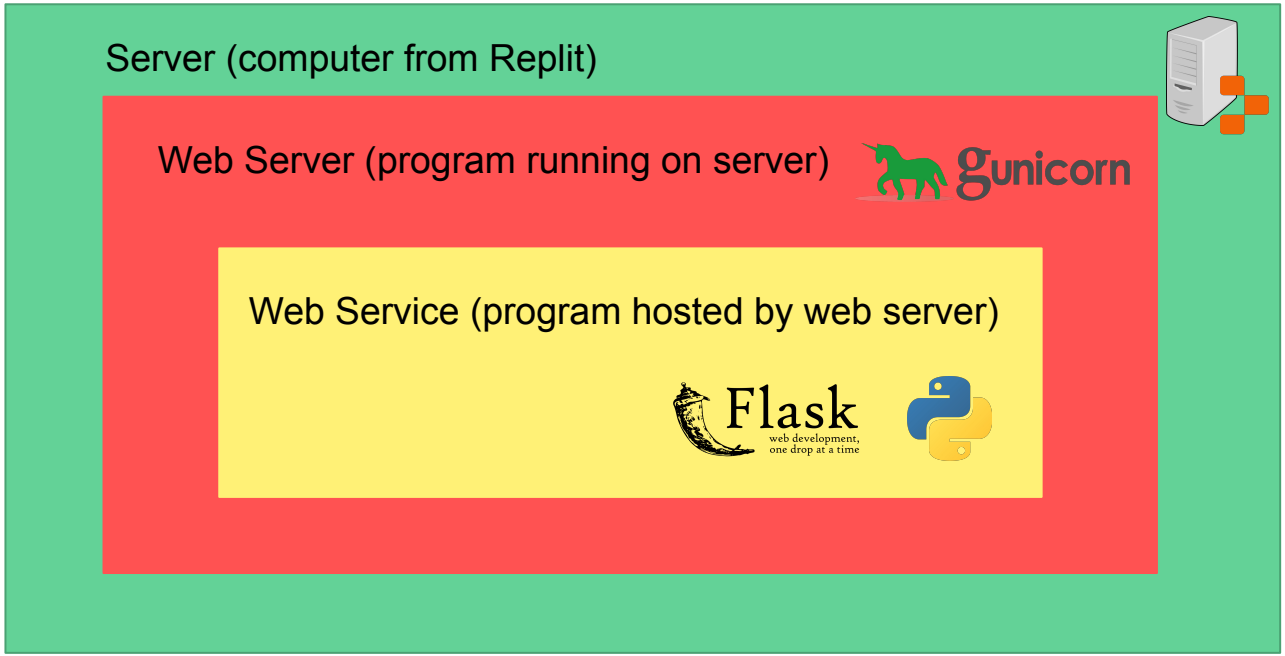
Web Service vs Web Server

A **Web Service** is an application that can be accessed over a network, such as the internet. A **Web Server** is a program that delivers content over HTTP.


Server (computer from Replit)
Web Server (program running on server)
gunicorn
Web Service (program hosted by web server)
Flask
web development,
one drop at a time

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Popular Web Servers

APACHE HTTP SERVER PROJECT

Microsoft IIS

NGINX

Apache Tomcat

LIGHTTPD fly light.

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Create Battlesnake

Name

Python Starter Snake

Engine Region

AWS US-WEST-2 (Oregon)

https://starter-snake-python.yourusername.replit.com

Description

My Very First Simple Battlesnake

Tags

Python

Aggressive

Alpha-Beta

Open Source Project

Allow anyone to add this Battlesnake to their game

Private - Only I can create games with this Battlesnake.

SAVE

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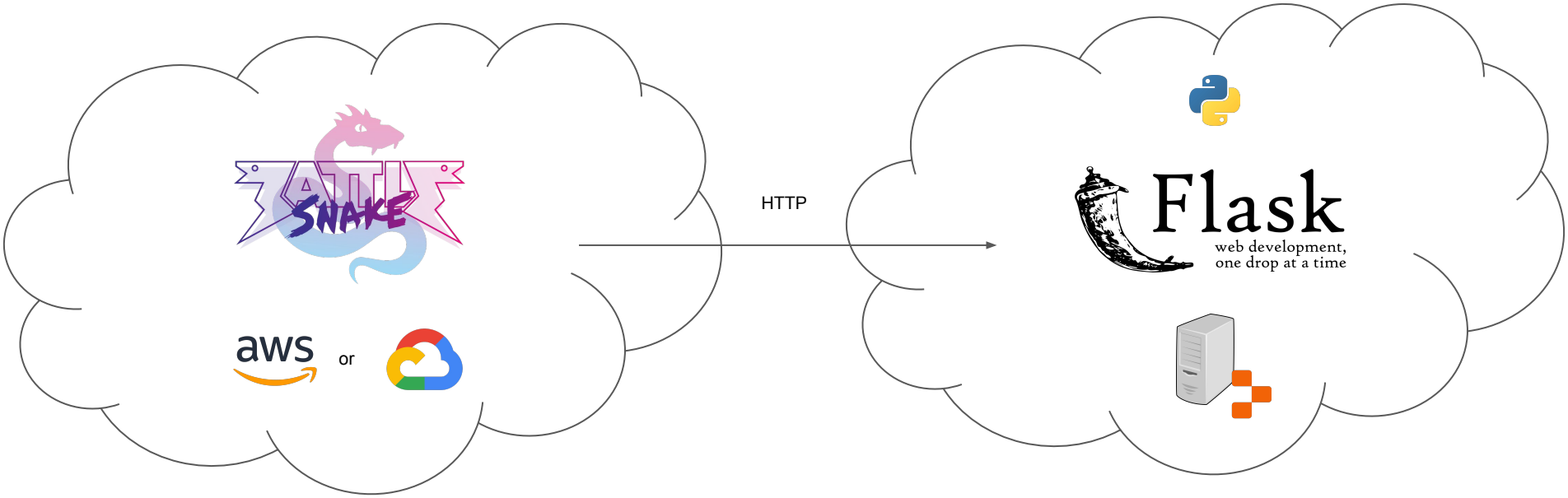

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replit

Why you shouldn't host on replit.

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Deployment Options

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How to prepare for deployment

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- Next: Standalone WSGI Containers

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Deployment Options

While lightweight and easy to use, **Flask's built-in server is not suitable for production** as it doesn't scale well. Some of the options available for properly running Flask in production are documented here.

If you want to deploy your Flask application to a WSGI server not listed here, look up the server documentation about how to use a WSGI app with it. Just remember that your `Flask` application object is the actual WSGI application.

Hosted options

- Deploying Flask on Heroku
- Deploying Flask on Google App Engine
- Deploying Flask on Google Cloud Run
- Deploying Flask on AWS Elastic Beanstalk
- Deploying on Azure (IIS)
- Deploying on PythonAnywhere

Self-hosted options

- Standalone WSGI Containers
  - Gunicorn
  - uWSGI
  - Gevent
  - Twisted Web
  - Proxy Setups

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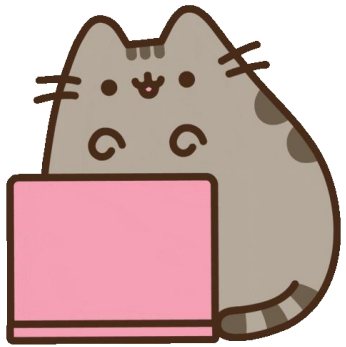
Development vs Production Environment

Development mode includes useful warnings and gives you access to tools that make development and debugging easier. **Production** mode minifies your code and better represents the performance your app will have on end users' devices.



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Don’t commit secrets. Use Env vars.

.env

```
MY_SECRET_KEY=”shhhhh”
```

lib/authorization.js

```
function authorizeService() {
  const auth = Service.auth({
    key: process.env.MY_SECRET_KEY
  })
}
```

Production vs Development keys *

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Deployment at Scale

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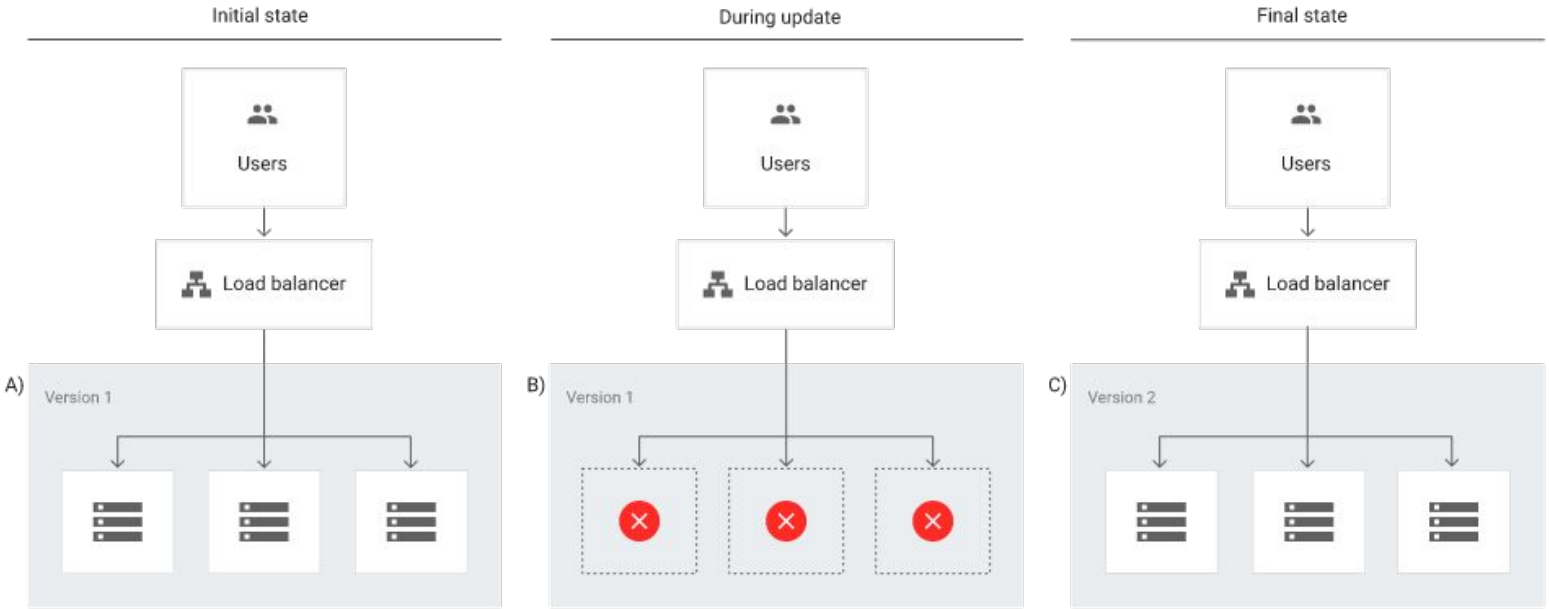
Recreate deployment pattern



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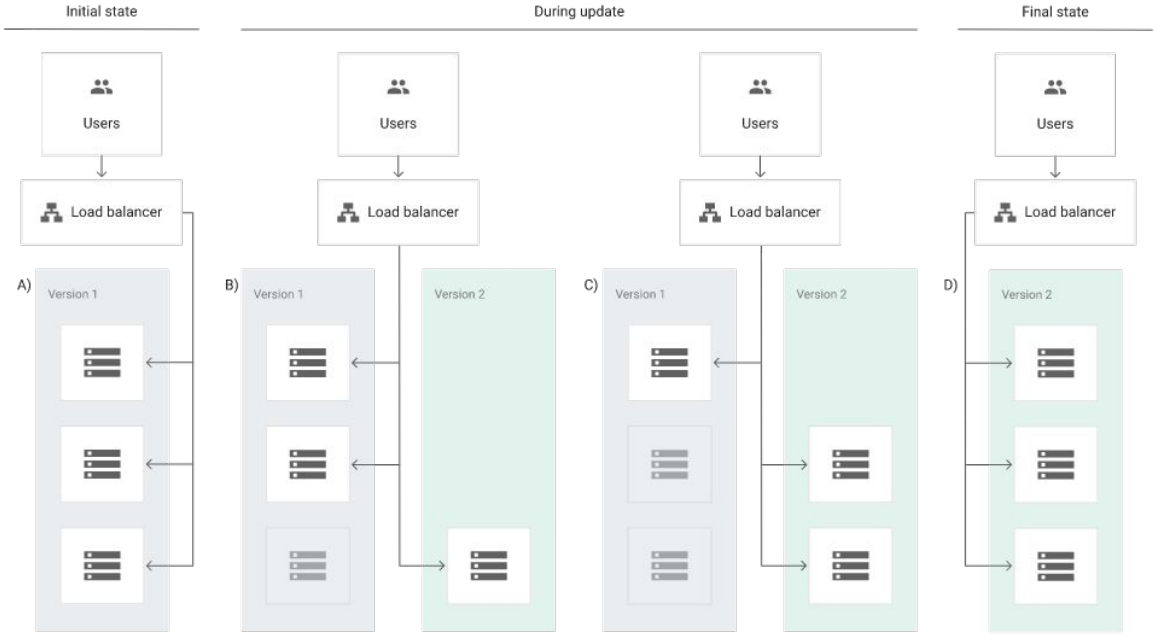
Rolling update deployment pattern



Version 2 is gradually rolled out and replaces Version 1

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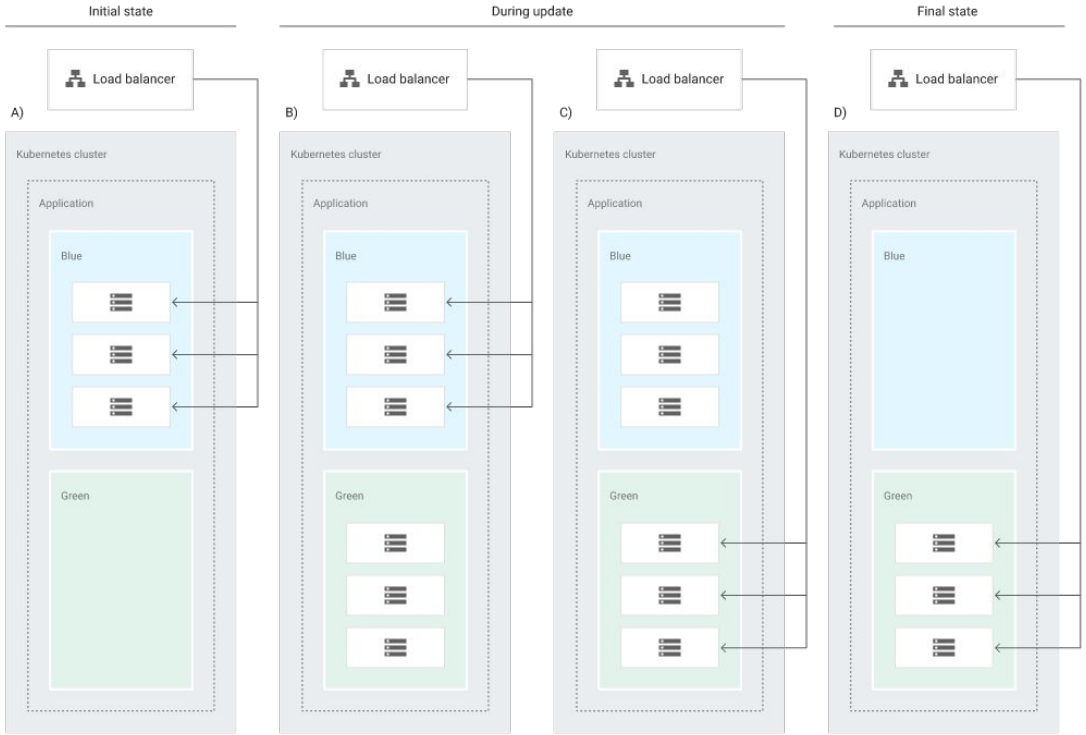
Blue/green deployment pattern

- Zero downtime
- Instant rollback
- Cost and operational overhead
- Backward compatibility



Version 2 is released alongside Version 1; the traffic is switched to Version 2 after it is tested.

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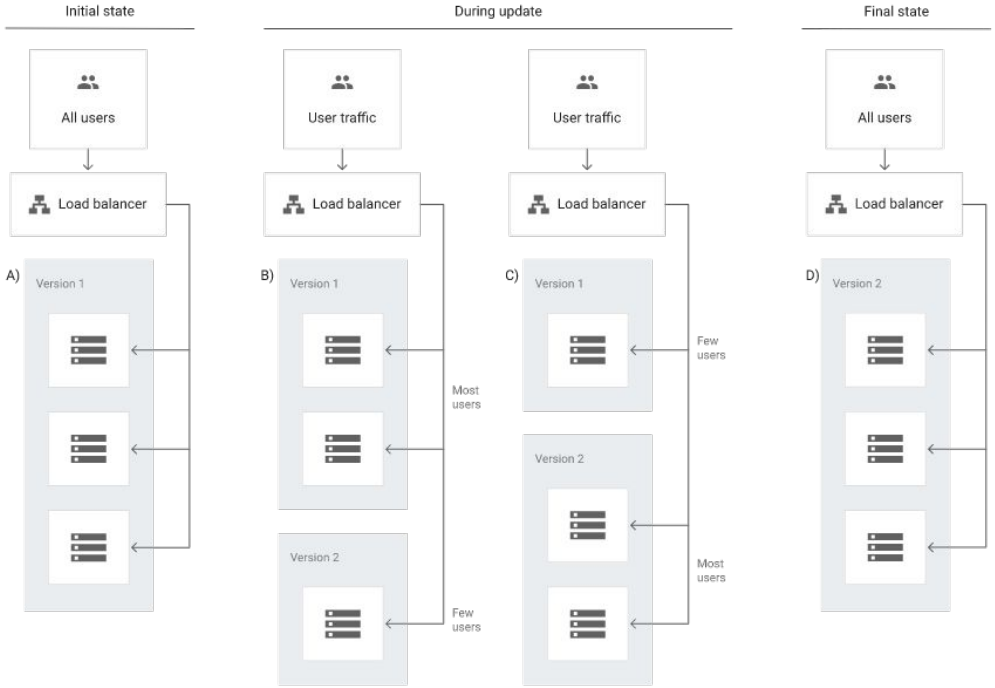
Canary Test Pattern

- Ability to test live production traffic
- Fast rollback
- Zero downtime
- Slow rollout



Version 2 is released to a subset of users, followed by a full rollout.

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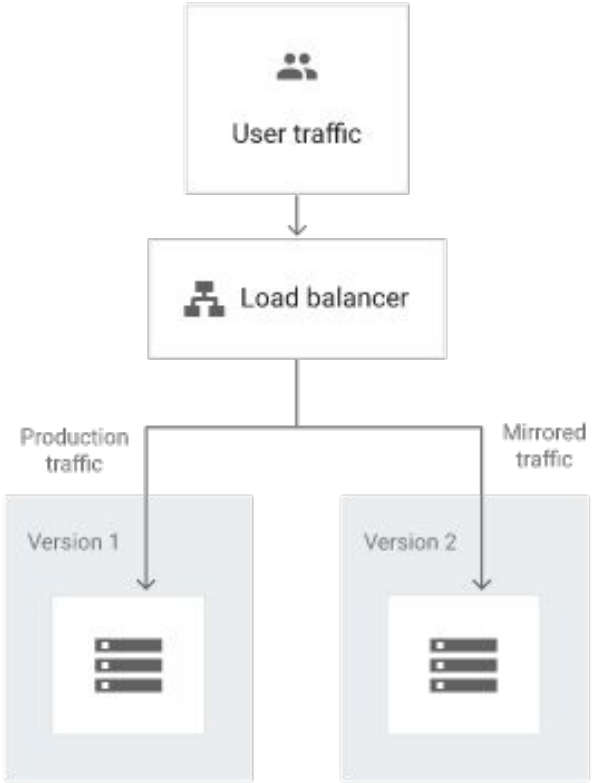
Shadow test pattern

Version 2 receives real-world traffic without impacting user requests.

Cost and operational overhead.



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Thank You!

Questions?